EMC²

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EMC Simple Support Matrix

EMC Symmetrix VMAX 10K (Systems with SN xxx959xxxx)

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The information in this ESSM is a configuration summary. For more detailed information, refer to https://elabnavigator.emc.com.

Table 1 E-Lab qualified specific versions or ranges for EMC® Symmetrix® VMAX® 10K SN xxx959xxxx with EMC Enginuity™ 5876 (page 1 of 2)

	Path and Volume Management					Cluster			Virtual Provisioning™ Host Reclamation [h]	Solution Enabler	EMC Storage Management Software
	PowerPath®		Native MPIO/ LVM	Symantec / Veritas / DMP /V xVM / VxDMP		Native	Symantec / Veritas / SFRAC/ VxCFS / SF HA [m]	Oracle RAC		SE	EMC Unisphere® for VMAX
Platform Support	Target Rev	Allowed		Target Rev	Allowed						
AIX 5200-10-08-0930 [g, k]		5.3 - 5.3 SP1 P01 [j]	Y			PowerHA (HACMP) 5.4 - 7.1				7.4, 7.5.x - 7.6	1.0 - 1.6
AIX 5300-09-01-0847 [g, k]	5.5 P02 - 5.5 P06, 5.7	5.3 - 5.3 SP1 P01 [j]		5.1 SP1	5.0 MP3 - 5.1		5.0 - 5.0 MP3	10g - 11g	Symantec SF 5.1 SP1		
AIX 6100-02-01-0847 [g, k]				5.1 SP1 - 6.0.1, 6.0.3, 6.1.0			5.0 MP3 - 6.0.3	11g	Symantec SF 5.1 SP1- 6.0.1, 6.0.3, 6.1.0		
AIX 7100-00-02-1041 [g, k]		5.3 SP1 P01 [j]; 5.5 - 5.5 P01		5.1 SP1 PR1 - 6.0.1, 6.0.3, 6.1.0			5.1 SP1 - 6.0.3, 6.1	11g R2	Symantec SF 5.1 SP1 PR1 - 6.0.1, 6.0.3, 6.1.0		
(AIX) VIOS 2.1.1 or later [t, k]	5.5 or later										
HP-UX, 11iv1 [b, k]	5.1 SP2	5.1 - 5.1 SP1	Pvlinks [d] / Y		3.5	SG 11.16		10g		7.4, 7.5.x - 7.6	1.0 - 1.6
HP-UX, 11iv2 [b, k]	5.1 SP2 - 5.2				5.0	SG 11.16 - 11.19	5.0	10g R2- 11g R1			
HP-UX, 11iv3 [b, k]			Y	5.1 SP1 - 6.0.1, 6.0.3	5.0 - 6.0.1, 6.0.3	SG 11.17 - 11.20	5.0 - 6.0.3	10g R2- 11g R2	Symantec SF 5.1 SP1 - 6.0.1, 6.0.3		
Linux: AX 2.0 GA - 2.0 SP3 [b, c, s]			Y [e]							7.4, 7.5.x - 7.6	1.0 - 1.6
Linux: AX 3 [b, c]	5.5- 5.6 and 5.7 SP1 - 5.7 SP1 P01 [p]	5.3.x [j, p]	Y								
Linux: AX 4 [b]	5.6 and 5.7 SP1 [p]										
Linux: Citrix XenServer 6.x [r]	5.5 [p]	5.3.x [j, p]				Y					
Linux: OL 4 U4 - 4 U7 [b, c, s]					5.0 MP2 - 5.0 MP4						
Linux: OL 5.0, 5.1 - 5. 2 [b, c]					5.0 MP3 - 5.0 MP4			10g - 11g			
Linux: OL 5.3 - 5. 5 [b]				5.1 SP1	5.0 MP3 - 5.1				Symantec SF 5.1 SP1		
Linux: OL 5.6	5.5 - 5.6 [p]										
Linux: OL 5.7 - 5.10	5.6 [p]	5.3.x [j, p]		6.0				11g	Symantec SF 6.0		
Linux: OL 5.6, 6.0 - 6.1 (UEK)	5.6 P01, 5.7 SP1, 5.7 SP1 P01- P02 [p], 5.7 SP3										
Linux: OL 5.7 (UEK)	5.6 P02, 5.7 SP1, 5.7 SP1 P01 P02 [p], 5.7 SP3							11 g R2			
Linux: OL 5.8 - 5.9, 6.2 - 6.4 (UEK)	5.7 SP1, 5.7 SP1 P01 P02, 5.7 SP3										
Linux: RHEL 4.0 U2 - U4 [b, c, l, s]; 4.5-4.9 [b, c, l, s]		5.3.x [j, p]	Y [e]		4.1 MP2 - 5.0 MP4	Y	4.1, 5.0	10g - 11g			1.0 - 1.6
Linux: RHEL 5.0, 5.1 [b, c]	5.5 - 5.6, 5.7 SP1, 5.7 SP1 P01 P02 [p], 5.7 SP3				5.0 MP3 - 5.0 MP4		5.0 MP3 - 5.1				
Linux: RHEL 5.2 [b, c]											
Linux: RHEL 5.3 - 5.4 [b, n]				5.1 SP1	5.0 MP3 - 5.1		5.0 MP4 - 5.1 SP1		Symantec SF 5.1 SP1		
Linux: RHEL 5.5 - 5.6 [b, n]				5.1 SP1 - 6.0.3, 6.1.0	5.0 MP4- 5.1		5.0 MP4 - 6.0.3		Symantec SF 5.1 SP1- 6.0.3 6.1.0		
Linux: RHEL 5.7 [n]	5.6, 5.7 SP1, 5.7 SP1 P01 P02 [p], 5.7 SP3		Y								
Linux: RHEL 5.8											
Linux: RHEL 5.9											
Linux: RHEL 5.10	5.7 SP1 P01 P02 [p], 5.7 SP3										
Linux: RHEL 6.0	5.6, 5.7 SP1, 5.7 SP1 P01 P02 [p], 5.7 SP3			5.1 SP1 PR1 & PR2			5.1 SP1 PR2	11g R2	Symantec SF 5.1 SP1 PR2		
Linux: RHEL 6.1, 6.2				5.1 SP1 PR1 - 6.0.3, 6.1.0			5.1 SP1 PR2 - 6.0.3		Symantec SF 5.1 SP1 PR2 - 6.0.3, 6.1.0		
Linux: RHEL 6.3, 6.4				5.1 SP1 PR2 & RP3, 6.0.1 - 6.0.3 6.1.0			5.1 SP1 RP3, 6.0.1 - 6.0.3		Symantec SF 5.1 SP1 PR2 & RP3, 6.0.1 - 6.0.3 6.1.0	7.6.x	
Linux: RHEL 6.5											

Table 1 E-Lab qualified specific versions or ranges for EMC® Symmetrix® VMAX® 10K SN xxx959xxxx with EMC Enginuity™ 5876 (page 2 of 2)

Platform Support	Path and Volume Management					Cluster			Virtual Provisioning™ Host Reclamation [h]	Solution Enabler	EMC Storage Management Software
	PowerPath®		Native MPIO/ LVM	Symantec / Veritas / DMP /V xVM / VxDMP		Native	Symantec / Veritas / SFRAC/ VxCFS / SF HA [m]	Oracle RAC		SE	EMC Unisphere® for VMAX
	Target Rev	Allowed		Target Rev	Allowed						
Linux: SLES 9 SP3 - SLES 9 SP4 [b]		5.3.x [j, p]	Y		5.0 - 5.0 MP4	Y	4.1, 5.0	10g		7.4, 7.5.x - 7.6.x	1.0 - 1.6
Linux: SLES 10 - SLES 10 SP3 [c]	5.5			5.1 SP1 - 6.0.3	5.0 MP3 - 5.1		5.0 - 5.1, 5.1 SP1- 6.0.3	10g R2 - 11g	Symantec SF 5.1 SP1 - 6.0.3		
Linux: SLES 10 SP4 [c]	5.5 - 5.7 SP1, 5.7 SP1 P01- P02 [p], 5.7 SP3				5.0 MP4 - 5.1						
Linux: SLES 11 - SLES 11 SP2				5.1 SP1 - 6.0.3, 6.0.4, 6.1.0			5.0 MP3 - 5.1, 5.1 SP1- 6.0.3, 6.1	11g R2 - 12c R1	Symantec SF 5.1 SP1 - 6.0.3, 6.0.4, 6.1.0		
Linux: SLES 11 SP3	5.7 SP2, 5.7 SP3			6.0.4, 6.1.0			6.0.4	11g R2	Symantec SF 6.0.4, 6.1.0		
Microsoft Windows 2003 (x86 and x64) SP2 and R2 SP2 [b]	5.5 - 5.7 SP2	5.3 - 5.3 SP1 [j]		5.1 SP2	5.0 - 5.1 SP1	MSCS	5.0 - 5.1	10g - 11g	Symantec SF 5.1 SP2 [i]	7.4, 7.5.x - 7.6	1.0 - 1.6
Microsoft Windows 2008 (x86) SP1 and SP2			MPIO / Y		5.1 - 5.1 SP1	Failover Cluster	5.0 - 5.1 SP2				
Microsoft Windows 2008 (x64) SP1 and SP2 [n]				5.1 SP2 - 6.0.1			5.0 - 6.0.1		Symantec SF 5.1 SP2 [i], 6.0.1		
Microsoft Windows 2008 R2 and R2 SP1 [n]							5.1 - 6.0.1				
Microsoft Windows Server 2012	5.5 SP1 - 5.7 SP2			6.0.2			6.0.2		Symantec SF 6.0.2	7.5.x - 7.6	1.5 - 1.6
Microsoft Windows Server 2012 R2	5.7 SP1 - 5.7 SP2										
OpenVMS Alpha v7.3-2, 8.2, 8.3, 8.4 [k]			Y			Y				7.4, 7.5.x - 7.6	1.0 - 1.6
OpenVMS Integrity v8.2-1, 8.3,8.3-1H1, 8.4 [k]											
Solaris 8 SPARC [b, l]	Refer to the Solaris Letters of Support, located at https://elabnavigator.emc.com, Extended Support tab.										
Solaris 9 SPARC [b]	5.5 - 5.5 P02	5.3 - 5.3 P04 [j]	MPxIO / Y	5.1 SP1	5.0 - 5.1	SC 3.1 - 3.2	5.0 - 5.1	10g - 11g	Symantec SF 5.1 SP1	7.4, 7.5.x - 7.6	1.0 - 1.6
Solaris 10 SPARC				5.1 SP1 - 6.0.3, 6.1.0		SC 3.1 - 3.3	5.0 - 6.0.1, 6.0.3	10g R2 - 11g	Symantec SF 5.1 SP1 - 6.0.3, 6.1.0		
Solaris 10 x86				5.1 SP1_x64 - 6.0.3_x64	5.0_x64 - 5.1_x64				Symantec SF 5.1 SP1_x64 - 6.0.3_x64		
Solaris 11 SPARC				6.0 PR1 - 6.0.1, 6.0.3, 6.1.0		SC 4.0	6.0 PR1 - 6.0.1, 6.03, 6.1	11g R2	Symantec SF 6.0 PR1 - 6.0.1, 6.0.3, 6.1.0		
Solaris 11.1 SPARC	5.5 P01 - 5.5 P02			6.0.3, 6.1.0		SC 4.1	6.0.3, 6.1	11g R2, 12c R1	Symantec SF 6.0.3, 6.1.0	7.6	1.6
Solaris 11 x86	5.5 - 5.5 P02			6.0 PR1_x64 - 6.0.1, 6.0.3_x64		SC 4.0	6.0 PR1 - 6.0.1, 6.03	11g R2	Symantec SF 6.0 PR1 - 6.0.1, 6.0.3_x64	7.4, 7.5.x - 7.6	1.0 - 1.6
Solaris 11.1 x86	5.5 P01 - 5.5 P02			6.0.3_x64		SC 4.1	6.0.3	11g R2, 12c R1	Symantec SF 6.0.3_x64	7.6	1.6
VMware ESX/ESXi 4.0 (vSphere) [b]	PP/VE 5.4 - 5.4 SP1	N/A	NMP			ESX		11g		7.4, 7.5.x - 7.6	1.0 - 1.6
VMware ESX/ESXi 4.1 (vSphere) [b, f n]	PP/VE 5.4 SP2			VxDMP 6.0 - 6.0.1							
VMware ESXi 5.0 (vSphere) [n, o]	PP/VE 5.7 [q], 5.7 P02 [q], 5.8, 5.9 SP1			VxDMP 6.0.1, 6.1							
VMware ESXi 5.1 (vSphere) [n, o]	PP/VE 5.7 P02 [q], 5.8, 5.9 SP1									7.6	1.6
VMware ESXi 5.5 (vSphere) [n, o]	PP/VE 5.8, 5.9 SP1			VxDMP 6.1							

Contact your EMC account team for any microcode NDU (non-disruptive upgrade) requirements or prerequisites. Reference EMC Knowledge Base emc293818.

Target Rev = EMC recommended versions for new and existing installations. These versions contain the latest features and provide the highest level of reliability.
Allowed = Older EMC-approved versions that are still functional, or newer/interim versions not yet targeted by EMC. These versions may not contain the latest fixes and features and may require upgrading to resolve issues or take advantage of newer product features. Versions are suitable for sustaining existing environments but should not be targeted for new installations.

See Table 1 Footnotes and Components, next page.

Table 1 Footnotes for EMC Symmetrix VMAX 10K SN xxx959xxxx with EMC Enginuity 5876	
Legend: Y = Qualified; not version-specific Blank = Not qualified NA = Not applicable	a. VMAX 10K xxx959xxxx supports only Virtual Provisioned devices. b. Supports 1 GB HBAs, but only with FC_SW connectivity. c. 8 Gbs initiator support begins with AX 2.0 SP3, AX 3.0 SP2, OL 4.0 U7, OL 5.2, RHEL 4.7, RHEL 5.2, SLES 10 SP2. d. Pvlinks is an HP-UX alternate pathing solution that does not support load balancing. e. MPIO with AX supported at AX 2.0 SP1 and later. MPIO with RHEL supported at RHEL 4.0 U3 and later. f. Minimum ESX 4.1 is required to support new 5875 VMware VAAI API. g. Minimum ODM definition 5.3.0.3 for AIX 5.2, 5.3, and 6.1. Minimum ODM definition 6.0.0.0 for AIX 7.1. h. Refer to the Best Practices Virtual Provisioning Technical Notes. Refer to the EMC Virtual Provisioning table (https://elabnavigator.emc.com) for all VP (without host reclamation) qualified configurations. i. Requires Symantec patch version 5.1.20007.87 and DMP. (There is no support for other multipathing software). j. These PowerPath versions have reached EOL. For extended support contact PowerPath Engineering or https://support.emc.com/products/PowerPath. k. Only server vendor-sourced HBAs are supported. l. Refer to the appropriate Letter of Support on the E-Lab Navigator, Extended Support tab, End-of-Life Configurations heading, for information on end-of-life configurations. m. Refer to Symantec Release Notes (www.symantec.com) for supported VxVM versions, which are dependent on the Veritas Cluster version. n. EMC XtremSF™ and XtremeCache™ software operating system and host server support information, refer to the ESM, located at https://elabnavigator.emc.com, and use VMAX 10K, along with the XtremSF model, in the search engine. o. Refer to the *VMware vSphere 5* ESSM, at https://elabnavigator.emc.com, Simple Support Matrix tab, Platform Solutions, for additional details. p. Version and kernel specific. q. Before upgrading to vSphere 5.1, refer to EMC Knowledgebase articles emc302625 and emc305937. r. All guest operating systems and features that Citrix supports, such as XenMotion, XenHA, and XenDesktop, are supported. s. This operating system is currently EOL. All corresponding configurations are frozen. It may no longer be publicly supported by the operating system vendor and will require an extended support contract from the operating system vendor in order for the configuration listed in the ESSM to be supported by EMC. It is highly recommended the customer upgrade the server to an ESSM-supported configuration or install it as a virtual machine on an EMC-approved virtualization hypervisor. t. Consult the Virtualization Hosting Server (Parent) Solutions table in E-Lab Navigator at https://elabnavigator.emc.com for your specific VIOS version prior to implementation.
Table 1 Components for EMC Symmetrix VMAX 10K SN xxx959xxxx with EMC Enginuity 5876	
Host Servers/ Adapters	All Fibre Channel HBAs from Emulex, QLogic (2 Gb/s or greater), and Brocade (8 Gb/s or greater), including vendor rebranded versions. Solaris requires an RPQ when using any Brocade HBA. All 10 Gb/s Emulex, QLogic, Brocade, Cisco, Broadcom, and Intel CNAs (10GbE NICs that support FCoE). All 1 Gb/s or 10 Gb/s NICs for iSCSI connectivity, as supported by Server/OS vendor. Any EMC or vendor-supplied OS-approved driver/ firmware/BIOS is allowed. EMC recommends using latest E-Lab Navigator listed driver/firmware/BIOS versions. Adapters must support link speed compatible with switch (fabric) or array (direct connect). All host systems are supported where the host vendor allows the host/OS/adapter combination. If systems meet the criteria in this ESSM, no further ELN connectivity validation and no RPQ is required.
Switches	All FC SAN switches (2 Gb/s or greater) from EMC Connectrix®, Brocade, Cisco, and QLogic for host and storage connectivity are supported. Refer to the Switched Fabric Topology Parameters table located on the E-Lab Navigator (ELN) at https://elabnavigator.emc.com for supported switch fabric interoperability firmware and settings.
Operating environment	Enginuity code v5876.82.57 GA release. Refer to the ELN at https://elabnavigator.emc.com for the complete list of available versions.
Federated Live Migration (FLM)	For details on FLM support, refer to the *EMC Federated Live Migration Simple Support Matrix* located at https://elabnavigator.emc.com.

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Table 2 VMAX 10K SN xxx959xxxx director bit settings for Fibre Channel switches

Category	Flag Description	VMAX 10K SN xxx959xxxx Factory Default Settings	VPLEX	Windows 2003 SP1 and later	Windows 2008 / 2012	Linux	HP-UX 11i v1 and 11i v2	HP-UX 11i v3	IBM AIX	Solaris	VMware	HP-OpenVMS	Celerra
FC	Loop ID	0											
SCSI	Soft Reset	s											
SCSI	Environment Reports to Host	e											
SCSI	Common SN	C							*(opt.)*				
SCSI	Disable Queue Reset on Unit Attention	d				D				*(opt.)*			
SCSI	Avoid Reset Broadcast	arb											ARB
SCSI	SCSI3 Interface	SC3 [b]											
SCSI	SCSI Primary Commands	SPC2 [b]											
SCSI	OS2007	OS07	*os07*			*(opt.)*	*(opt.)*	*(opt.)*		os07	*(opt.)*	*(opt.)*	
SCSI	Enable Volume Set Addressing	v					V	V					
FC	Non Participate Hard Addressing	np											
FC	Enable point to point mode	PP											
FC	Unique Worldwide Name	UWN											
SCSI	Initiator Group	ACLX		*(opt.)*									
	Open VMS	ovms										OVMS	
FC	Enable Auto Negotiation	EAN [a]		*(opt.)*									
	FA AS400	as4											
FC	Link Speed	*2/4/8* Gb [c]											
SCSI	WPB (not controllable by user)	wpb											
Legend:	Blank = Default setting is required.												
	Lowercase = Value disabled (off).												
	Uppercase = Value enabled (on).												
	(opt.) = Optional. (Optional settings are tolerated and may be used as required by specialized configuration.)												
Notes:	a. When EAN is enabled (by default), the link speed is negotiated by the target port and switch up to the maximum capable speed. Refer to the appropriate Symmetrix Product Guide for more information. b. Factory Default setting is not to be changed since EMC requires setting the SC3 and SPC2 flags. c. The link speed setting is only effective when the EAN flag is disabled. The supported link speeds will be dependent on the I/O module installed.												

Table 3 VMAX 10K SN xxx959xxxx director bit settings for Fibre Channel Direct Connect

Category	Flag Description	VMAX 10K SN xxx959xxxx Factory Default Settings	VPLEX	Windows 2003 SP1 and later	Windows 2008 / 2012	Linux	HP-UX 11i v1 and 11i v2	HP-UX 11i v3	IBM AIX	Solaris	VMWare	Celerra
FC	Loop ID	0		0-126								
SCSI	Soft Reset	s										
SCSI	Environment Reports to Host	e										
SCSI	Common SN	C							*(opt.)*			
SCSI	Disable Queue Reset on Unit Attention	d				D				*(opt.)*		
SCSI	Avoid Reset Broadcast	arb										ARB
SCSI	SCSI3 Interface	SC3 [b]										
SCSI	SCSI Primary Commands	SPC2 [b]										
SCSI	OS2007	OS07	*os07*			*(opt.)*	*(opt.)*	*(opt.)*		os07	*(opt.)*	
SCSI	Enable Volume Set Addressing	v					V	V				
FC	Non Participate Hard Addressing	np					NP	NP				
FC	Enable point to point mode	PP		pp								
FC	Unique Worldwide Name	UWN										
SCSI	Initiator Group	ACLX		*(opt.)*								
Host	Open VMS	ovms										
FC	Enable Auto Negotiation	EAN [a]		*(opt.)*								
Host	FA AS400	as4										
FC	Link Speed	*2/4/8* Gb [c]										
SCSI	WPB (not controllable by user)	wpb										

Legend:
- Blank = Default setting is required.
- Lowercase = Value disabled (off).
- Uppercase = Value enabled (on).
- *(opt.)* = Optional. (Optional settings are tolerated and may be used as required by specialized configuration.)

Notes:
a. When EAN is enabled (by default), the link speed is negotiated by the target port and HBA up to the maximum capable speed. Refer to the appropriate Symmetrix Product Guide for more information.
b. Factory Default setting is not to be changed since EMC requires setting the SC3 and SPC2 flags.
c. The link speed setting is only effective when the EAN flag is disabled. The supported link speeds will be dependent on the I/O module installed.

Table 4 VMAX 10K SN xxx959xxxx director bits for iSCSI

Category	Flag Description	VMAX 10K SN xxx959xxxx Factory Default Settings	Windows 2003 SP1 and later	Windows 2008 / 2012	Linux	IBM AIX	VMware	Solaris
SCSI	Soft Reset	s						
SCSI	Environment Reports to Host	e						
SCSI	Common SN	C				c *(opt.)*		
SCSI	Disable Queue Reset on Unit Attention	d			D			D *(opt.)*
SCSI	Avoid Reset Broadcast	arb						
SCSI	SCSI3 Interface	SC3 [b]						
SCSI	SCSI Primary Commands	SPC2 [b]						
SCSI	OS2007	OS07			*(opt.)*		*(opt.)*	os07
SCSI	Enable Volume Set Addressing	v						
SCSI	Initiator Group	ACLX						
Host	Open VMS	ovms						
SCSI	WPB (not controllable by user)	wpb						
SCSI	Initiator Session ID	isid						
iSCSI	IPV4 address	0.0.0.0	0-255.0-255.0-255.0-255					
iSCSI	IPV4 Netmask	0	0-32					
iSCSI	Link Speed	1 Gb / 10 Gb [a]	*(opt.)*					
iSCSI	Default Gateway	0.0.0.0	(opt.)					
iSCSI	iSNS IP Address	0.0.0.0						
iSCSI	Max Transmission Unit	1500						
Legend:	Blank = Default setting is required.							
	Lowercase = Value disabled (off).							
	Uppercase = Value enabled (on).							
	(opt.) = Optional. (Optional settings are tolerated and may be used as required by specialized configuration.)							
Notes:	a. Dependant on hardware interface installed. b. Factory Default setting is not to be changed since EMC requires setting the SC3 and SPC2 flags.							

Table 5 VMAX 10K SN xxx959xxxx director bits for FCoE

Category	Flag Description	VMAX 10K SNxxx959xxxx Factory Default Settings	Windows 2003 SP1 and later	Windows 2008 / 2012	Linux	HP-UX 11i v1 and 11i v2	HP-UX 11i v3	IBM AIX	VMware	Solaris
SA	Soft Reset	s								
SA	Environment Reports to Host	e								
SA	Common SN	C						*(opt.)*		
SA	Disable Queue Reset on Unit Attention	d			D					*(opt.)*
SA	Avoid Reset Broadcast	arb								
SA	SCSI3 Interface	SC3 [a]								
SA	SCSI Primary Commands	SPC2 [a]								
SA	OS2007	OS07			*(opt.)*	*(opt.)*	*(opt.)*		*(opt.)*	os07
FA	Enable Volume Set Addressing	v				V	V			
FA	Open VMS	ovms								
SA	WPB (not controllable by user)	wpb								
FA	Simple Configuration Management (not controllable by user)	scm								
FA	FC-BB-6 standard (not controllable by user)	FC-BB-6 (disabled)								
	MAX FCF logins (not controllable by user)	1 (disabled)								
Data	VLAN ID 1 (not controllable by user)	0 (disabled)								
SCSI	Initiator Group	ACLX								
Legend:	Blank = Default setting is required.									
	Lowercase = Value disabled (off).									
	Uppercase = Value enabled (on).									
	(opt.) = Optional. (Optional settings are tolerated and may be used as required by specialized configuration.)									
Notes:	a. Factory Default setting is not to be changed since EMC requires setting the SC3 and SPC2 flags.									

Table 6 Layers supporting device flag DIF1 (T10 PI/DIX minimum versions)

T10 DIX Layer	
Application	Any Oracle Database application
Database	Oracle Database 11g with Oracle Automatic Storage Management (ASM)
Operating system	Oracle Linux 5.x or 6.x with UEK kernel versions 2.6.39-200.24.1 or later, oracleasmlib 2.0.8 or later
T10 PI Layer	
HBA models: driver/firmware	Emulex LPe12000-E and LPe12002-E with firmware 2.01a10 or later and driver 8.3.5.68.6p or later
Array	EMC Symmetrix VMAX Series with Enginuity 5876.82.57

Note: T10 PI/DIX is supported by any layer meeting minimum version requirement listed in Table 6. For upper layers to support features, all layers below it must also be enabled and support the feature. T10 PI (Protection Information) provides additional data integrity from the array's disk drive through to the HBA (host bus adapter). T10 DIX (Data Integrity Extensions) facilitates protection information interchange between the operating system and HBA through to, and including, enabled applications.